



APPLICATION NOTE

IOT based Control system of Refrigeration Unit for
Cold storage System

ABSTRACT

The Application note talks about how a complete control and IOT solution was designed for a Biomass based refrigeration system

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IoT Based Control system and Monitoring

Key Problem Solved

Controls

The entire control system was enabled using the Control Graph stack from Edgemate. The control was done using Modbus IO distributed at different locations. Edgemate Control Graph provided for real time actions in the field to maintain the temperature and humidity. The refrigeration involved a new concept of Biomass Powered Refrigeration Unit with a patented process.

Local Monitoring

Using the Edgemate Disp series of hardware, the entire user Interface was displayed using a 7 inch onboard display for monitoring and Control.

Remote Access

The Edgemate stack provided for remote access of device for making changes in Control Logic, as well as performance monitoring of the Unit.

Data Logging/Reporting

Maintaining 6 months of data for temperature of cold Rooms

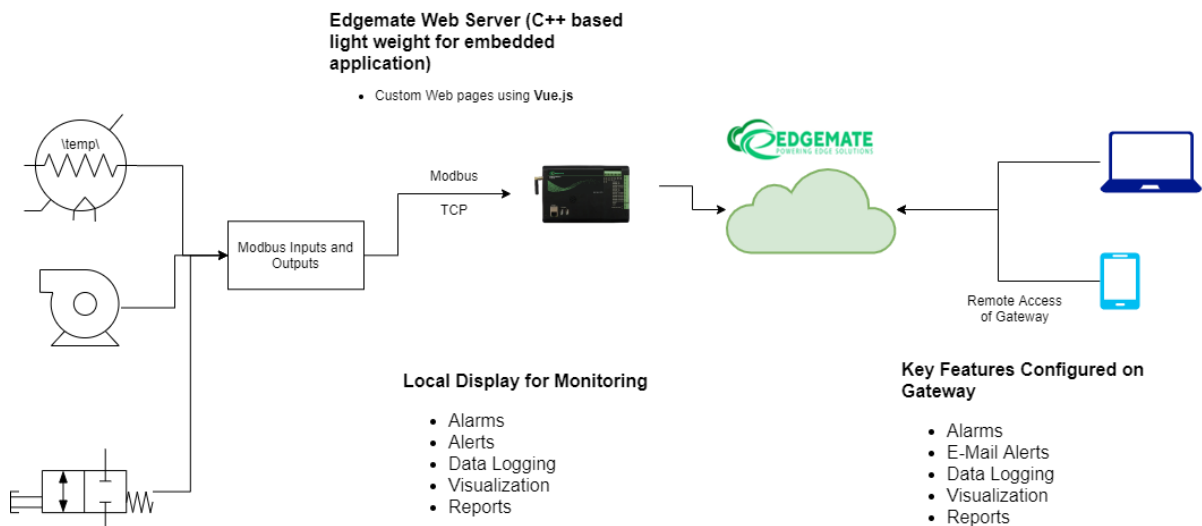
Email and alerts

The customer wanted the alert / notification in case of temperature exceeding the setpoints, failure to meet temperature requirement or change over when communication fails.

Custom Built Interface

The user required an custom built interface which was built on Vue.js which was hosted on the Edgemate Webserver.

Solution Architecture



Device: EdgeMate 3B+ | macchir x Macchina Template x New tab

Not secure | https://606a9e89-3eb5-474c-be05-b827eb4b5a37.remote.devanture.org/macchina/vue/#/machina/systemInfo

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System Information

System Information Processes Memory Usage

```

top - 09:00:58 up 2 days, 18:04, 2 users, load average: 0.28, 0.10, 0.03
Tasks: 159 total, 1 running, 158 sleeping, 0 stopped, 0 zombie
%Cpu(s): 5.6 us, 30.0 sy, 0.0 ni, 63.3 id, 0.0 wa, 0.0 hi, 1.1 si, 0.0 st
MiB Mem : 923.1 total, 88.0 free, 230.8 used, 604.3 buff/cache
MiB Swap: 100.0 total, 98.2 free, 1.8 used. 630.0 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 6405 pi        20   0 11216 3036 2608 R   15.0   0.3   0:00.10 top
 6402 pi        20   0  7768 2668 2504 S   10.0   0.3   0:00.03 bash
   68 root       20   0     0     0     0 S    5.0   0.0   0:01.40 kswapd0
  386 pi        20   0 504940 94168 32156 S    5.0  10.0 32:02.18 EdgeMateS+
  422 root       20   0 40240 8920 3872 S    5.0   0.9 11:32.13 redis-ser+
    1 root       20   0 33980 8936 6956 S    0.0   0.9  0:34.81 systemd
    2 root       20   0     0     0     0 S    0.0   0.0  0:00.74 kthreadd
    3 root        0 -20     0     0     0 I    0.0   0.0  0:00.00 rcu_gp
    4 root        0 -20     0     0     0 I    0.0   0.0  0:00.00 rcu_par_gp
    8 root        0 -20     0     0     0 I    0.0   0.0  0:00.00 mm_percpu+
    9 root       20   0     0     0     0 S    0.0   0.0  0:00.00 rcu_tasks+
   10 root       20   0     0     0     0 S    0.0   0.0  0:00.00 rcu_tasks+
   11 root       20   0     0     0     0 S    0.0   0.0  0:19.78 ksoftirqd+
   12 root       20   0     0     0     0 I    0.0   0.0  5:35.50 rcu_sched
  
```